

# A New Gastropod Fauna From An Oligocene Back-Reef Lagoonal Environment In West Central Florida

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## ABSTRACT

Twenty-one new species of gastropods and three new gastropod genera are described from a newly-recognized back-reef lagoonal facies of the Oligocene Suwannee Formation. The new species, which were collected in a limestone quarry in westernmost Polk County, Florida, include: *Astraca* (*Astralium*) *polkensis* n. sp. (Turbinidae), *Pyrazisinus kendrewi* n. sp. (Potamididae), *Prismacerrithium prisma* n. sp. (Cerithiidae), *Pachyceromnium dalli* n. sp. and *Pachyceromnium mansfieldi* n. sp. (both Naticidae), *Cypracorbis kendrewi* n. sp. (Cypraeidae), *Spinifolius gemmulatum* n. sp. (Buccinidae), *Solenosteira suwanneensis* n. sp. (Buccinidae), *Vasum suwanneensis* n. sp. (Turbinellidae), *Falsilyria kendrewi* n. sp. (Volutidae), *Conomitra kendrewi* n. sp. (Volutomitridae), *Dentimargo dalli* n. sp., *Persicula dockeryi* n. sp., *Persicula macnili* n. sp., *Persicula suwanneensis* n. sp., *Prunum cricac* n. sp., *Prunum jessiae* n. sp., *Prunum sandrac* n. sp. (all Marginellidae), *Conus asprella kendrewi* n. sp. (Conidae), *Pleurofusua dowlingsi* n. sp. (Turridae), and *Suwanneoscapha lindae* n. sp. (Cyclonidae). The new genera, which appear to be restricted to Oligocene coralline environments, include: *Cestumcerithium* n. gen. and *Prismacerrithium* n. gen. (Cerithiidae) and *Suwanneoscapha* n. gen. (Cyclonidae). In total, seventy-two species of gastropods were collected from four different back-reef lagoonal biotopes, including bioherms of the branching coral *Stylophora miniatissima*, open-bottom sand areas, sea grass beds, and intertidal mud flats with oyster bars.

**Key words:** Oligocene, Florida, Suwannee Formation, Coral Bioherm, Gastropoda.

## INTRODUCTION

The early Oligocene (Latdorfian) gastropod fauna of the lower Mississippi River Valley and southeastern United States has long been known to be one of the most species-rich in the Eastern North American Cenozoic. This tropical-subtropical fauna is of particular interest to evolutionary paleontologists and biogeographers in that it

contains the first-known examples of many classic Neogene Eastern American endemic genera and is the ancestor of the Miocene, Pliocene, and Pleistocene Callosahatchian Molluscan Provinces (Petuch, 1982; 1988). As presently understood, the richest and best-preserved Oligocene assemblages are found only in southwestern Mississippi State (MacNeil & Dockery, 1984), and this area is considered the archetype for the early Oligocene. To date, three hundred and ninety-seven species and subspecies of gastropods are known from the Vicksburg Group (MacNeil & Dockery, 1984).

In the early part of the Twentieth Century, Vicksburg-aged gastropod faunas were discovered along the Flint River and Blue Springs areas near Bainbridge, Georgia (Dall, 1916). These were found to be associated with the rich and extensive Oligocene coral reefs that were described from the same area by Vaughan (1900). Later, Mansfield (1937) described an even richer Floridian Vicksburg-aged gastropod fauna, primarily from quarries in Pasco and Hernando Counties (west central Florida) and showed that several Flint River species occurred that far south. Although containing some elements of the classic Vicksburg fauna of the Mississippi Embayment, these two southern coral reef-associated faunas also housed numerous characteristic endemic elements, including the strombid *Orthaulax*, the volutid *Falsilyria*, and a distinctive assemblage of over fifteen species of cerithiids and five potamidids (combined Flint River and Suwannee Formations). Since Mansfield's work in 1937, however, no new comprehensive study of the systematics of the Suwannee gastropods has been published.

Recently, an exposure of a previously-unknown, highly fossiliferous facies of the Suwannee Formation has been found in a limestone quarry in extreme western Polk County, west central Florida (The Terramar Pit on Florida Highway 54, approximately 5 miles east of Zephyrhills, Pasco County) (E. Vokes, 1992). This locality rep-

represented a back-reef lagoonal environment that had formed behind a reef tract to the west and contained the largest number of gastropod species yet found at any single Suwannee exposure. All specimens of corals and mollusks from the Terramar site are silicified (siliceous pseudomorphs), much like the Flint River material, and are generally well-preserved. Through the intensive collecting of Mr. Eric Kendrew of Valrico, Florida, and through additional collecting by myself, seventy-two species of gastropods (listed in Appendix 1) are now known from the Terramar Pit, more than doubling Mansfield's total of thirty-one species. Nine of the Suwannee species reported by Mansfield (1937) and one by E. Vokes (1992) were not collected at the Terramar site, and these are listed in Appendix 2. When Mansfield's and Vokes' additional species are combined with the list of those from the back-reef lagoonal environment, the total number of known Suwannee gastropods increases to eighty-two, less than one third of the number of Vicksburg species.

Of the seventy-two species collected at the Terramar Pit, twenty-one are new to science. Three new genera, all of which appear to be endemic to the coralline environments of the Flint River and Suwannee Formations, are also new. Following a discussion of the paleoecology of the Terramar Oligocene site, these new species and genera are described.

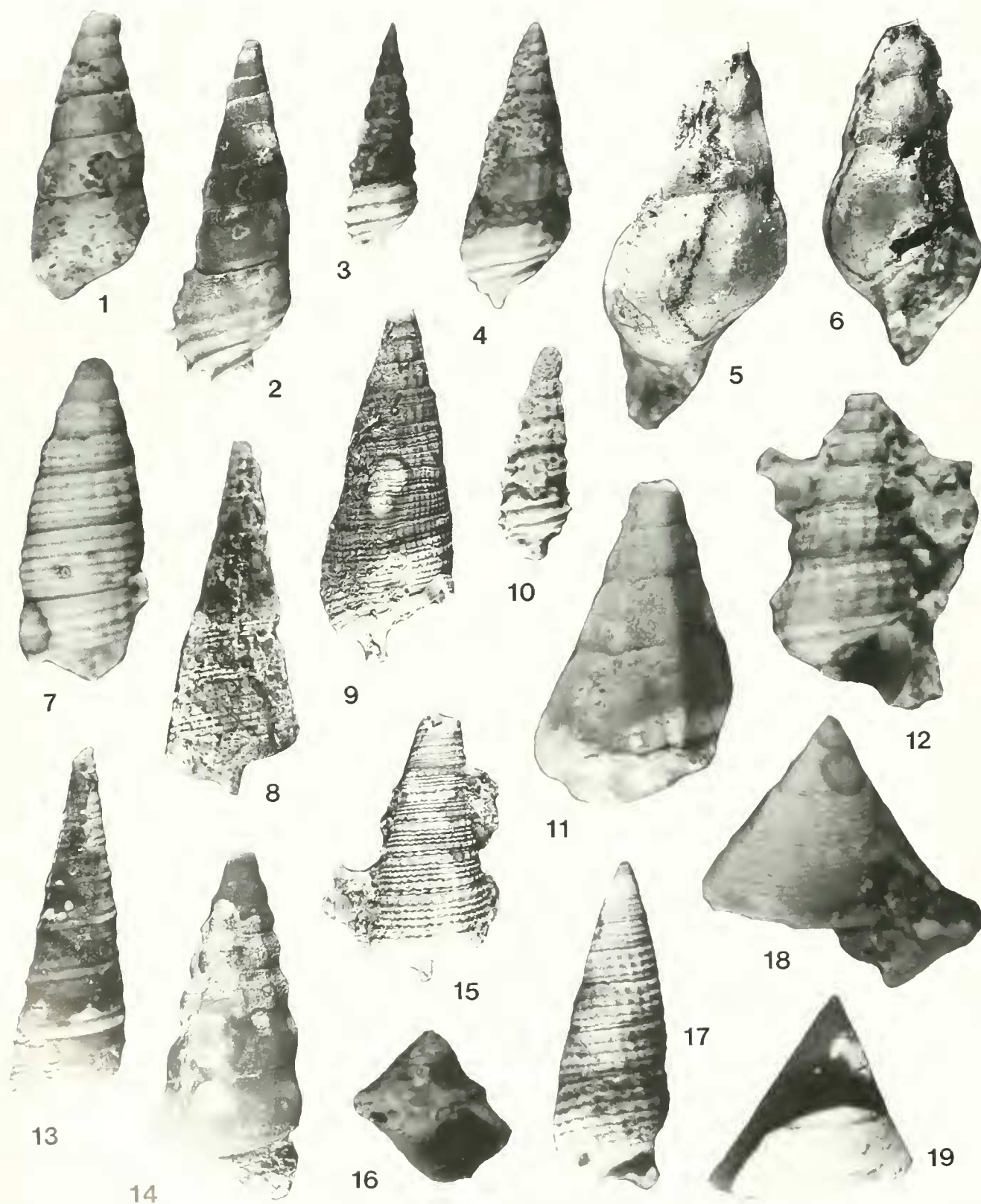
#### PALEOECOLOGY OF THE BACK-REEF LAGOONAL ENVIRONMENT OF THE SUWANNEE FORMATION

The study material from the Terramar Pit was collected either as perfectly-preserved specimens loosely embedded in a residual unconsolidated calcilitite or as specimens embedded in blocks of a dense, partially-silicified limestone. These specimens were often removed in a fragmentary state. Judging from the biotic assemblage collected in both lithofacies, the entire area represented a shallow (less than 5m depth), quiet-water carbonate lagoon. This lagoon formed behind a still-unstudied coral reef tract that had developed farther to the west. Evidence for this unmapped Oligocene reef tract, including the presence of massive coral heads and reef mollusks such as the bivalves *Lima halensis* Dall, 1916 and *Chama* sp. and the stromboidean gastropod *Terchellum hernandoensis* Mansfield, 1937, has been uncovered in quarries in central Pasco and Hernando Counties (Mansfield, 1937). The Terramar lagoonal environment, existing between this reef tract and the Oligocene western coast of Florida, contained four main substrate types: 1. bioherms composed of *Stylophora* corals; 2. deeper lagoonal, open-bottom areas; 3. sea grass beds, and; 4. very shallow-water oyster beds and intertidal mud flats.

Of the four biotopes that existed within the Terramar back-reef lagoon, that of the *Stylophora* coral bioherms was apparently the most extensive. Composed almost entirely of the small branching coral *Stylophora minutissima* Vaughan, 1900 these bioherms formed densely

intermeshed beds that sheltered a wide variety of gastropods. Many blocks of limestone examined contained literally hundreds of small pieces of this branching coral and loose fragments were the most abundant component of the residuum facies. As evidenced by having been collected *in situ* in *Stylophora*-rich limestone blocks, a number of Suwannee endemic mollusks appear to have been associated with these bioherms. Some of the most characteristic gastropods include *Calliostoma silicatum* Mansfield, 1937 (figure 19) *Cypracorbis kendrewi* n. sp. (figures 22, 23), *Solenosteira suwanneensis* n. sp. (figures 33, 34), *Vasum suwanneensis* n. sp. (figures 48, 49), *Falsilyria kendrewi* n. sp. (figures 37, 38), and *Comus (Asprella) kendrewi* n. sp. (figure 72). Several of the large Suwannee cerithiids, including *Cestumcerithium brooksvillensis* (Mansfield, 1937) (figures 3, 10) *Cestumcerithium pascoensis* (Mansfield, 1937) (figure 2), and *Prismacerithium prisma* n. sp. (figures 5, 6, 11) were also associated with the *Stylophora* bioherms. Interestingly, several specimens of *Pachyromminum mansfieldi* n. sp. (figure 30) were also collected in *Stylophora*-rich limestone, possibly indicating that this naticid may have lived on, or in close proximity to, the coral bioherms. The rare muricid *Poirieria (Dallimurex) rufirupicolus* (Dall, 1916) (figure 31), which was previously known only as an internal mold from the Flint River Formation, was also found to be associated with this biotope. Small heads of the star corals *Montastrea bainbridgensis* (Vaughan, 1919) and *Antiguastrea silicensis* Vaughan, 1919 were also present, although uncommonly, throughout the *Stylophora* bioherms.

Interspersed between the coral bioherms in deeper water (approximately 4–5 m) areas were large patches of open, fine-grained carbonate sand bottom. This biotope supported a rich gastropod fauna of which the Suwannee endemics *Oliva (Onogymna) brooksvillensis* (Mansfield, 1937) (figure 65) and *Apicula bowenae* (Mansfield, 1937) (figure 13) were the most abundant. A large Vicksburg-aged marginellid fauna also was associated with this biotope, and included species such as *Persicula dockeryi* n. sp. (figures 52, 53), *Prunum cricac* n. sp. (figure 64), *Prunum jessicae* n. sp. (figures 56, 57), and *Prunum sandrae* n. sp. (figures 58, 59). The strombid *Orthaulax hernandoensis* Mansfield, 1937 (figures 20, 21) which is also present in the coral reef environments of the Flint River Formation, was abundant on these open bottom areas, living in large colonies much like *Strombus* s.s. species do in the Recent. Several of the new Suwannee species described here, such as *Pachyromminum dalli* n. sp. (figure 26), *Spinifulgur gemmulatum* n. sp. (figure 47), *Conomitra kendrewi* n. sp. (figures 44, 45) and *Pleurofusua dowlingi* n. sp. (figure 68) also appear to be associated with this biotope. All of the widespread Vicksburgian gastropods found in the Terramar Pit (Appendix 1, designated by the letter "V"), including such characteristic species as *Semicertagus menuthafontis* MacNeil, 1954 (figure 7), *Ficus mississippiensis* Conrad, 1848 (figure 24), *Talitiphis mississippiensis* (Gertmann, 1969) (figure 29), *Pallacera caseyi* (MacNeil, 1848), *Clavolithes vicks-*



Figures 1-19. Trochidae: Turbinidae, Potamididae, Cerithiidae, and Modulidae from the Suwannee back-reef lagoons. 1. *Cerithium* new genus? *cookei* Dall, 1916, length 36 mm. 2. *Cestumcerithium pascoensis* (Mansfield, 1937), smooth variant, length 37 mm, type of the new genus *Cestumcerithium*. 3. *Cestumcerithium brooksrellensis* (Mansfield, 1937), length 24 mm. 4. *Cestumcerithium lincocksensis* (Mansfield, 1937) length 24 mm. 5, 6. *Prismacerithium prismia* Petuch, n.sp., holotype (UF 75978) (fragmentary, missing



*burgensis* (Conrad, 1848)(figure 46), *Fusinitra conquista* (Conrad, 1848)(figure 50), and *Terebra Terebrellina* *divisura* Conrad, 1848, were associated with this open-bottom area. The Flint River species *Semivertagus silicium* (Dall, 1916)(figure 17), *Cerithium* (new genus?) *cookei* Dall, 1916 (figure 1), *Ampullinopsis flintensis* (Mansfield, 1937) (figure 25), and *Falsilyria mansfieldi* (Dall, 1916)(figures 39,40), also occurred in this biotope. The classic Suwannee index echinoid *Rhycholampas gouldii* (Bouvé) was abundant on these open-bottom areas and may have been preyed-upon by the widespread Vicksburgian *Phalium caelatura* (Conrad, 1848)(figure 27).

Also interspersed between the large *Stylophora* bioherms were beds of sea grass, most probably *Thalassia*. Evidence for these *Thalassia* beds is seen in the presence of characteristic indicator gastropods, all of which have *Thalassia*-dwelling descendants in the Recent. Living on the sea grass blades were a number of small algivorous species, including *Astraca* (*Astralium*) *polkensis* n. sp. (figure 18), *Cerithium insulatum* Dall, 1916, (figure 12) and *Modulus liveoakensis* Mansfield, 1937 (figure 16), and a large fauna of small, *Thalassia*-loving marginellids such as *Dentimargo dalli* n. sp. (figures 62,63), *Hyalina siliciflvia* (Dall, 1916)(figure 51), *Persicula macei* n. sp. (figures 54,55), and *Persicula suwanneensis* n. sp. (figures 60,61). Living within the grass beds were larger gastropods such as *Cerithioclava eutextile* (Dall, 1916)(figure 9), the Suwannee endemic *Turbinella suwanneensis* (Mansfield, 1937)(figure 42, 43), and a host of small bivalves, primarily *Chione bainbridgensis* Dall, 1916, *Phacoides heraudocensis* Mansfield, 1937, and *Glycymeris suwanneensis* Mansfield, 1937. A living analogue to the Suwannee grass bed community is seen in the Recent along Roatan Island, Honduras, where species of *Cerithioclava*, *Turbinella*, *Astraca*, *Modulus*, *Persicula*, *Hyalina*, and *Phacoides* all co-occur in *Thalassia* beds. The unusual Suwannee endemic bubble shell, *Suwanneoscapha lindae* n. sp. (figures 70,71), may also have been associated with the sea grass beds.

Faunal evidence also points to the existence of shallow intertidal mud flat environments within the Terramar lagoon system. This is seen in the presence of a distinctive potamidid fauna composed of two species of *Telescopium*, [*T. blackwaterensis* (Mansfield, 1937) figure 15, and *T. heraudocensis* (Mansfield, 1937) figure 5], and *Pyrazisinus kendrewi* n. sp. (figure 14). In the Recent Indo-Malaysian region, the amphibious genus *Telescopium*

lives on the highest mud flat areas near mangroves and is exposed to air for long periods of time. Often living along with *Telescopium* on these exposed flats is the genus *Terebralia*, which is closely related to the Floridian endemic genus *Pyrazisinus* and probably occupies the same ecological niche as did its extinct New World counterpart. The oyster *Ostrea paroxys* (Lesueur) Dockery, 1984 is commonly encountered in large masses in some blocks of limestone, indicating that small oyster bars also grew on these intertidal mud flats. The melongenid *Myristica crassicornuta* (Conrad, 1848)(figures 35, 36) and the muricid *Pteryotus propepostis* (Mansfield, 1937)(figure 64) were associated with these oyster bars and were probably the major predators on *Ostrea paroxys*. A Recent analogue to this Oligocene mud flat and oyster bar environment is seen in northwestern Australia along the Arafura Sea, where *Pteryotus* (*Pbednalli*), *Terebralia*, and *Telescopium* species occur together on mud flats and oyster bars near mangrove forests.

## SYSTEMATIC SECTION

The holotypes of the new species described here are deposited in the fossil invertebrate collection of the Florida Museum of Natural History, University of Florida, Gainesville, Florida, and bear UF numbers. Paratypes are deposited in the research collection of the author, as is a voucher collection of each species collected at the Terramar site. All specimens are siliceous pseudomorphs. A voucher collection is also deposited at the Graves Museum of Archaeology and Natural History, Dania, Florida.

### Class Gastropoda

#### Superfamily Trochoidea

#### Family Turbinidae

#### Subfamily Astracinae

#### Genus *Astraca* Röding, 1798

#### Subgenus *Astralium* Link, 1807

#### *Astraca* (*Astralium*) *polkensis* new species (figure 18)

**Description:** Shell small for genus and subgenus, conical, with elevated spire whorls; suture indistinct; periphery of body whorl flattened, blade-like, rounded, with faint serrations; peripheries of early whorls and spire whorls edged with 15–20 small, rounded knobs; whorls strongly ornamented with 5 strong, beaded spiral cords;

← approximately one-half of spire whorls), length 45 mm. (type of the new genus *Prismacerithium*). 7. *Semivertagus menthafontis* MacNeil, 1984, length 15 mm. 8. *Telescopium heraudocensis* (Mansfield, 1937), length 49 mm. 9. *Cerithioclava eutextile* (Dall, 1916), length 57 mm. 10. *Cestumcerithium brooksillensis* (Mansfield, 1937), heavily-sculptured variant, length 29 mm. 11. *Prismacerithium prisma* Petuch, n.sp., paratype (spire whorls, missing part of body whorl), length 19 mm. 12. *Cerithium* (*Theridium*) *insulatum* Dall, 1916, length 22 mm. 13. *Apicula boucnac* (Mansfield, 1937), length 39 mm. 14. *Pyrazisinus kendrewi* Petuch, n.sp., holotype (UF 75977), length 62 mm. 15. *Telescopium blackwaterensis* (Mansfield, 1937), length 43 mm. 16. *Modulus liveoakensis* Mansfield, 1937, height 15 mm. 17. *Semivertagus silicium* (Dall, 1916), length 15 mm. 18. *Astraca* (*Astralium*) *polkensis* Petuch, n.sp., holotype (UF 75976), height 11 mm. 19. *Calliostoma silicatum* Mansfield, 1937, height 14 mm.

1 to 3 extremely fine, threadlike secondary spiral cords present between 5 main cords; base of shell flattened, ornamented with 10 strong spiral cords; umbilical region slightly depressed.

**Material examined:** HOLOTYPE—Height 11 mm, diameter (incomplete) 13 mm, in back-reef lagoonal facies of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75976.

**Etymology:** Named for Polk County, Florida, locality of the Terramar Pit.

**Discussion:** This new species is the first *Astraca* known from the Eastern North American Oligocene. Of the known Cenozoic American *Astracium* species, *A. polkensis* is closest to the late Eocene (Jackson Stage) *Astraca* (*Astracium*) *withlacoochensis* Palmer, 1953 from the Inglis Formation of the Floridian Ocala Group. The new species differs from this probable Eocene ancestor in having a smaller shell with a flatter, less trochiform shape, stronger spiral sculpture on the whorls, and a reduced, nonprominent peripheral keel.

Superfamily Cerithioidea

Family Potamididae

Genus *Pyrazisinus* Heilprin, 1886

*Pyrazisinus kendrewi* new species  
(figure 14)

**Description:** Shell of average size for genus, elongated, cerithiform; whorls ornamented with large, prominent, evenly-spaced knobs; knobs distinctly angled at shoulder, averaging 10 per whorl; whorls sculptured with 5 large, prominent, raised spiral cords; base of shell flattened; suture impressed, slightly canaliculate; apertural region of unique holotype broken, so exact nature of adult lip is not known.

**Material examined:** HOLOTYPE—Length 62 mm, width 28 mm, in mud flat and oyster bar facies of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75977.

**Etymology:** Named for Mr. Eric Kendrew of Valrico, Florida, who collected the holotype in the Terramar Pit.

**Discussion:** *Pyrazisinus kendrewi* is the oldest-known member of its endemic Floridian genus. The new species is most similar to the Aquitanian Miocene *P. cornutus* (Heilprin, 1886) from the Tampa Member of the Arcadia Formation, but differs in being a narrower more elongated shell with more numerous knobs per whorl, in having an angled shoulder area and angled knobs, and in having a much more sculptured shell, with five distinct spiral cords.

Family Cerithiidae

Genus *Cestumcerithium* new genus

**Diagnosis:** Cerith shells of average-to-large size (25–45 mm), slender and elongated; sutures indented, pro-

ducing turreted spire whorls; shell sculpture characteristically composed of two distinct sections, with early whorls having a reticulate sculpture composed of strong, often beaded, spiral cords intersected by longitudinal ribs, and with the later whorls and body whorl being smooth, with five or six very large, very prominent belt-like spiral cords; on adults, belt-like cords extend beyond edge of lip, producing strong dentate, serrated appearance (shown here in figure 2); siphonal canal short, stubby.

**Type species:** *Cerithium pascoensis* Mansfield, 1937, Suwannee Formation, early Oligocene of Florida (figure 2).

**Other species in *Cestumcerithium*:** *Cerithium brooksullensis* Mansfield, 1937 (figures 3,10), *Cerithium liveoakensis* Mansfield, 1937 (figure 4), and *Cerithium suwanneensis* Mansfield, 1937, all from the Suwannee Formation, early Oligocene of Florida, and *Cerithium vaginatum* Dall, 1916, Flint River Formation, early Oligocene of southern Georgia and Alabama, and the Suwannee Formation of Florida.

**Etymology:** A combination of the Latinized Greek “cestus” (belt) and “Cerithium” (little horn), producing “belted little horn”, in reference to the prominent and characteristic cords on the body whorl.

**Discussion:** With the exception of the Flint River and Suwannee *Cestumcerithium vaginatum*, all other known species of this new genus have been found only in the Floridian Oligocene. Here, they appear to have been closely associated with the extensive coral reefs and coral bioherms that dominated Late Eocene western Florida. Four of the five known species are restricted to the Suwannee Formation and can be considered classic index fossils for the Floridian early Oligocene. The genus appears to have been restricted to the Oligocene, as no known members have been collected in the overlying Tampa Member of the Arcadia Formation (Aquitanian Miocene) or from the underlying Eocene formations.

The amount and degree of the characteristic belt-like corded sculpture appears to be variable, sometimes covering only the last two whorls and at other times covering most of the later whorls of members of the same species. This is particularly noticeable on the type species, *Cestumcerithium pascoensis*, which can be heavily belted (like the holotype, Mansfield, 1937, plate 7, figure 4) or relatively smooth, with only the body whorl being belted (like the specimen illustrated here in figure 2, or like Mansfield's “*Cerithium* sp. aff. *vaginatum* Dall”, plate 8, figure 4). Specimens of *C. pascoensis* with belted sculpture that intergrades between these two morphological extremes have been collected at the Terramar Pit, demonstrating their conspecificity. This same degree of sculptural variability is also seen in *C. brooksullensis*, with some specimens having at least half the whorls belted (like figure 10 shown here or like Mansfield's (1937) figure 3 on plate 7) and others having the belted sculp-

ture only on the body whorl (like figure 3 shown here or like Mansfield's figure 5 on plate 7).

*Cestumcerithium* is most similar to the sympatric genus *Theridium* but differs in having the body whorl, and sometimes the later whorls, sculptured with the prominent beltlike cords and in having a strongly dentate edge to the adult lip.

#### Genus *Prismacerithium* new genus

**Diagnosis:** Cerith shells of large size, averaging 60 mm in length, elongatedly pyramidal in outline; shells highly inflated, extremely thin and fragile; shoulder sloping, suture impressed, producing turreted spire whorls; whorls ornamented with 8 low, evenly-spaced narrow axial swellings, producing undulating, faceted appearance; undulating varices become obliquely angled on body whorl; entire shell surface smooth, faintly sculptured with 24–26 extremely fine, evenly-spaced incised spiral threads; aperture oval in shape, with adult lip almost nonexistent, only faintly thickened.

**Type species:** *Prismacerithium prisma* Petuch, n.sp., Suwannee Formation, early Oligocene of Florida (figures 5, 6, 11).

**Etymology:** A combination of the Latinized Greek "prisma" (sawed or faceted) and "Cerithium" (little horn), in reference to the faceted appearance of the shell whorls.

**Discussion:** With its large paper thin, highly inflated shell and faceted appearance, *Prismacerithium* stands out as one of the most distinctive members of the rich cerithiid fauna of the Suwannee coral reefs. Because of its extreme fragility, this new genus is almost always collected as broken fragments. Judging from the abundance of shattered pieces in the limestone blocks within the Terramar Pit, however, *Prismacerithium* must have been a common component of the *Stylophora* bioherms.

Although having the large size of other Suwannee cerithiid genera such as *Theridium*, *Cerithioclava*, and *Cestumcerithium*, *Prismacerithium* more closely resembles an immensely-oversized *Alaba*. Both genera, although differing greatly in size, share several morphological characteristics, such as the highly inflated, thin shell, distinct rounded axial swellings, and a shell ornamentation of finely incised spiral threads. Further research and larger collections of better specimens may show that *Prismacerithium* belongs, along with *Alaba* and *Alabina*, in the subfamily Diastomatinae.

At present, *Prismacerithium* is known only from the lagoonal facies of the Suwannee Formation. It bears no similarities to any other known large contemporaneous Eastern American cerithiid.

*Prismacerithium prisma* new species  
(figures 5, 6, 11)

**Description:** General shell shape, form, and size as for description of genus.

**Material examined:** HOLOTYPE—Length (fragmentary, missing approximately one-half of spire whorls) 45 mm, width 24 mm, in back-reef lagoonal facies (*Stylophora* bioherm) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75978; PARATYPE—length (spire whorls missing, part of body whorl 19 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named in reference to the faceted appearance of the shell.

Superfamily Naticoidea

Family Naticidae

Subfamily Globulariinae

Genus *Pachycrommium* Woodring, 1928

*Pachycrommium dalli* new species  
(figure 26)

**Description:** Shell small for genus, elongated, with rounded body whorl and high, stepped, scalariform spire; sutures highly indented, producing wide, shallowly canaliculate subsutural border; edge of canaliculate border slightly raised, faintly carinated; aperture oval; no umbilicus present.

**Material examined:** HOLOTYPE—Length 18 mm, width 13 mm, in back-reef lagoonal facies of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75979

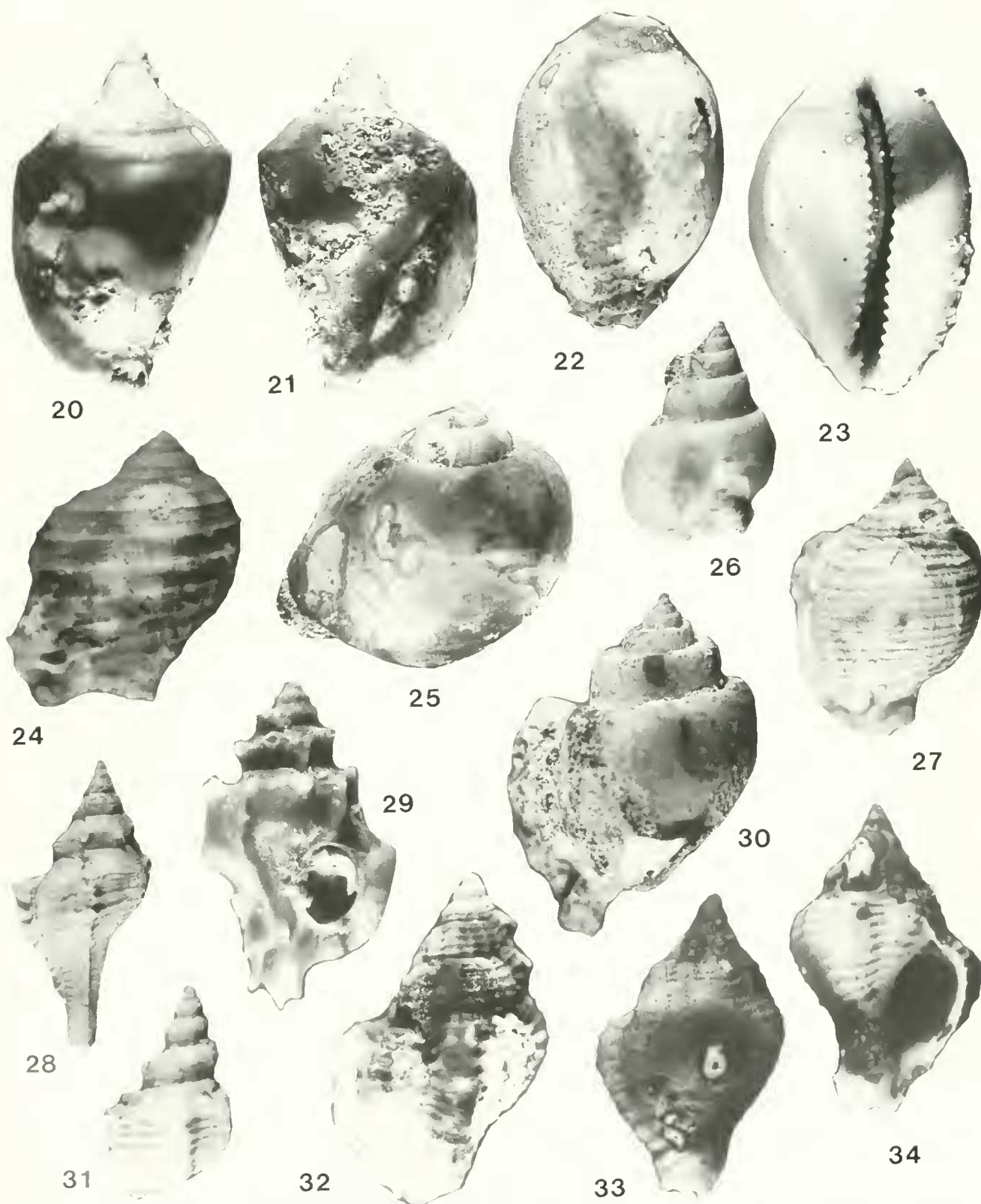
**Etymology:** Named in honor of the great pioneer paleomalacologist, William Healey Dall, who described the Flint River gastropod fauna.

**Discussion:** Before its formal description here, this small Oligocene naticid had been illustrated by both Dall (1916, plate 88, fig. 11) and Mansfield (1937, plate 9, fig. 7) but never correctly named. Dall referred it to "*Amauropsis ocalana* Dall", a Jackson-aged Eocene species from the Floridian Ocala Group (a *nomen dubium*—see Mansfield, 1937, p. 177). Mansfield later referred this species to "*Amauropsis* aff. *A. burnsi meridionalis* Pilsbry", a related but different shell from the Miocene Baitoa Formation of the Dominican Republic. Although similar-appearing, both the Eocene and Miocene species differ from *P. dalli* in being larger, more inflated shells with lower, less protracted spires, and in having deeper and wider subsutural channels. To date, *P. dalli* has only been collected in the Flint River and Suwannee Formations.

*Pachycrommium mansfieldi* new species  
(figure 30)

**Description:** Shell of average size for genus, inflated, globose, with rounded body whorl; spire protracted, scalariform; spire whorls relatively straight-sided; sutures highly indented, producing narrow, very deeply canaliculate subsutural border; edge of canaliculate border





Figures 20-34. Strombidae, Cypracidae, Ficidae, Cassidae, Naticidae, Muricidae, and Buccinidae from the Suwannee back-reef lagoons. 20,21. *Orthaulax hernandoensis* Mainsfield, 1937, length 70 mm. 22,23. *Cypracorbis kendrewi* Petuch, n.sp., holotype (UF 75951), length 26 mm. 24. *Ficus mississippiensis* Conrad, 1848, length 17 mm (fragmentary). 25. *Anpallinopsis fluitensis* (Mainsfield, 1937), length 27 mm. 26. *Pachycrommium dalli* Petuch, n.sp., holotype (UF 75979), length 15 mm. 27. *Phalium caelatura* (Conrad, 1848), length 29 mm. 28. *Pteripatus propeposti* (Mainsfield, 1937), length 35 mm. 29. *Talitiphus mississippiensis*

highly raised, producing sharp, distinct carina; aperture oval; no umbilicus present.

**Material examined:** HOLOTYPE—Length 27 mm, width 21 mm, in back-reef lagoonal facies (in association with *Stylophora bioherms*?) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75980; PARATYPE—length 24 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named in honor of Wendell C. Mansfield, the pioneer paleomalacologist who first described the Suwannee gastropod fauna.

**Discussion:** This new *Pachycromnium* closely resembles, and is probably ancestral to, *P. floridana* (Dall, 1892) from the Aquitanian Miocene Tampa Member of the Arcadia Formation. The new species differs from *P. floridana* in having a less-inflated shell with straighter sides to the whorls, a more protracted spire, and a much wider and deeper subsutural channel. At present, *P. mansfieldi* is known only from the coral reef lagoonal facies of the Suwannee Formation.

Superfamily Cypracoidea

Family Cypracidae

Subfamily Cypraeorbiniae

Genus *Cypracorbis* Conrad, 1865

*Cypracorbis kendrewi* new species  
(figures 22, 23)

**Description:** Shell of average size for genus, ovate, slightly subcylindrical; base flattened; aperture narrow, widening slightly toward anterior end, almost straight, recurving slightly at posterior end; labial teeth proportionally large, extending onto base of lip, 23 in number; columellar teeth smaller than labial teeth, 21 in number; extremities reduced, projecting only slightly from main shell body; spire and posterior extremity covered with broad, low callus; fossula poorly-developed, supported by single large tooth along anterior edge.

**Material examined:** HOLOTYPE—Length 26 mm, width 18 mm, in back-reef lagoonal facies (*Stylophora* bioherm) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75981; Paratype—length 26 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for Mr. Eric Kendrew of Valrico, Florida, who collected the holotype in the Terramar Pit.

**Discussion:** *Cypracorbis kendrewi*, one of the last species of the *Cypracorbis* lineage, is most similar to *C. ventripotens* (Cossman, 1903) from the Jackson Eocene

Moodys Branch Formation of Mississippi. The new species differs from this older cowrie in having a much more cylindrical, less inflated shell with straighter sides, more rounded, less projecting extremities, a straighter, less recurved aperture, and more numerous and finer apertural teeth. The Vicksburg Oligocene cowrie listed as "*Cypracorbis* aff. *C. ventripotens* (Cossman, 1903)" by MacNeil and Dockery (1984, plate 16, figs. 10, 12, 15) is very similar to *C. kendrewi*, but differs in being a more inflated, rounded shell with a slightly more recurved aperture. Further study may show that the Mississippi shell (from the Mint Springs Formation) belongs to a northern population of *C. kendrewi*.

Superfamily Buccinoidea

Family Busyconidae

Subfamily Busyconinae

Genus *Spinifulgur* Petuch, 1994

*Spinifulgur gemmulatum* new species  
(figure 47)

**Description:** Shell of average size for genus, with distinctly sloping shoulders and high pagodiform spire; edge of shoulder sharply angled, bordered by prominent, thick, undulating carina; undulations on carina produce small, rounded, evenly-spaced knobs, numbering between 14 and 18 per whorl; suture highly indented, causing carina on previous whorl to overhang subsequent whorl; sloping spire whorls heavily ornamented with 8 strong spiral threads between which are intercalated very fine secondary threads; body whorl (portion exposed in matrix, just anterior of shoulder carina of holotype) ornamented with 5 (extrapolated from holotype) very large, thick, beaded spiral cords; aperture and siphonal canal unknown.

**Material examined:** HOLOTYPE—Length (fragmentary, missing portion of body whorl and siphonal canal) 24 mm, width 16 mm, in back-reef lagoonal facies of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75928; PARATYPE—spire only, width 16 mm, same locality as holotype, in research collection of the author.

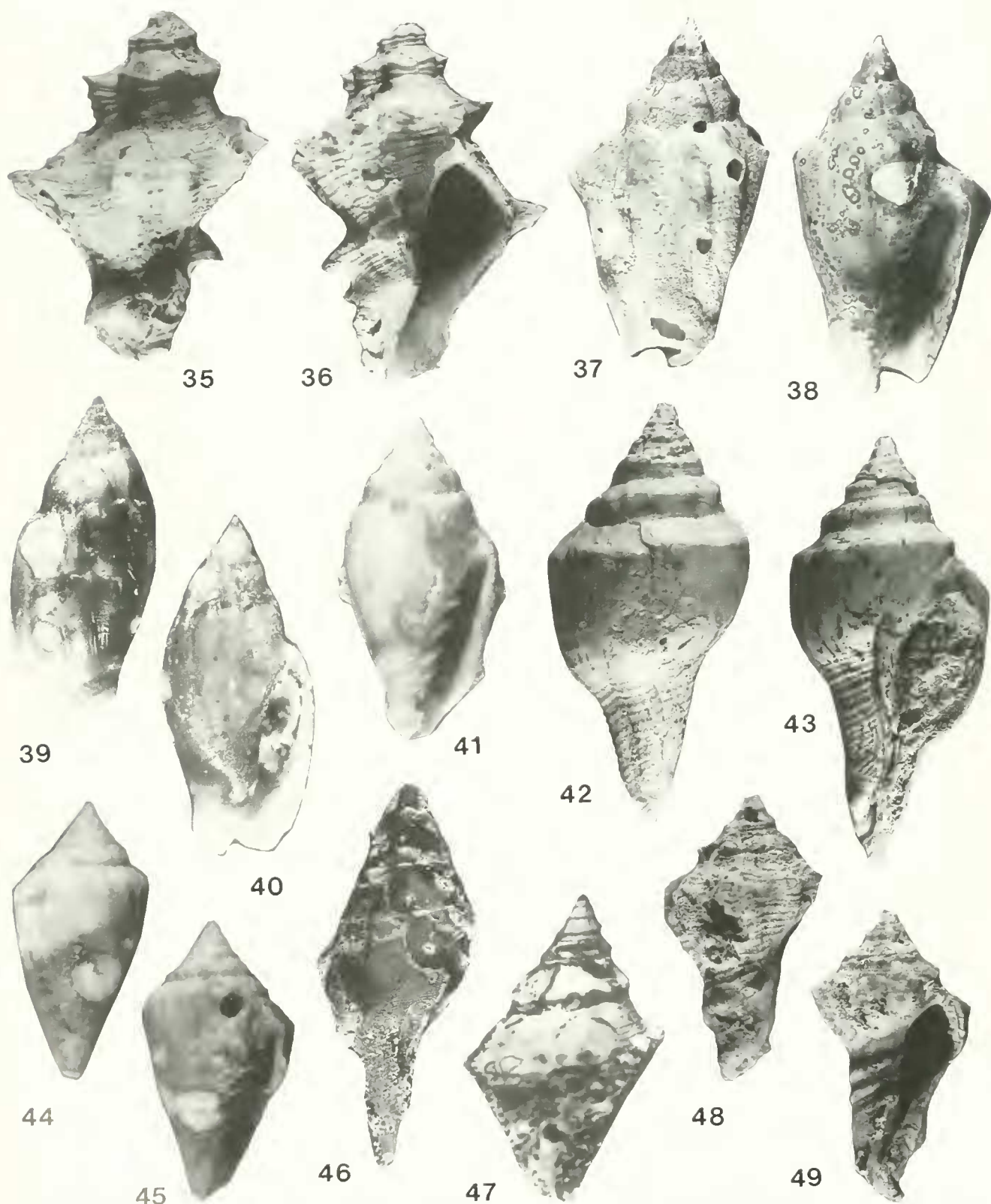
**Etymology:** "Gemmed", in reference to the characteristic gemlike knobs on the shoulder carina.

**Discussion:** *Spinifulgur gemmulatum*, although known only from fragmentary specimens, is so distinctive that its formal description seems warranted at this time. The new species is similar to slope-shouldered variants of the Vicksburg Oligocene *Spinifulgur spiniger* (Conrad, 1848) (such as the one illustrated by MacNeil

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(Gertmann, 1969), length 24 mm. **30.** *Pachycromnium mansfieldi* Petuch n.sp., holotype (UF 75980), length 27 mm. **31.** *Poirieria (Dallimurex) rufirupicolus* (Dall, 1916), fragmentary specimen, length 21 mm (missing portion of body whorl and siphonal canal). **32.** *Chicoreus stetopus* (de Gregorio, 1890), length 32 mm. **33,34.** *Solenosteira suwanneensis* Petuch, n.sp., holotype (UF 75983), length 27 mm.





Figures 35–49. Melongenidae, Busyconidae, Volutidae, Volutomitridae, and Turbinellidae from the Suwannee back-reef lagoons. 35,36. *Myristica crassicornuta* (Conrad, 1848), length 49 mm. 37,38. *Falsilyria kendrewi* Petuch, n.sp., holotype (UF 75985), length 37 mm. 39,40. *Falsilyria mansfieldi* (Dall, 1916), length 32 mm. 41. *Conomitra crenulata* Dockery, 1984, length 21 mm. 42,43. *Turbinella suwanensis* Mansfield, 1937, length 107 mm. 44,45. *Conomitra kendrewi* Petuch, n.sp., holotype (UF 75986), length 14 mm. 46. *Clavolites vicksburgensis* (Conrad, 1848), length 89 mm. 47. *Spinifulgur gemmulatum* Petuch, n.sp., holotype

and Dockery, 1984, plate 54, fig.6), but differs in lacking distinct spines, having, instead, low rounded knobs arranged in an undulating pattern. *Spinifulgur gemmulatum* also differs from *S. spiniger*, and any other known *Spinifulgur* species, in being heavily sculptured with wide, thick spiral cords on the body whorl. At present, this highly ornate species is known only from the Suwannee Formation.

#### Family Buccinidae

##### Subfamily Buccinae

#### Genus *Solenosteira* Dall, 1890

*Solenosteira suwanneensis* new species  
(figures 33, 34)

**Description:** Shell of average size for genus, broadly fusiform, inflated, with high, protracted spire; shoulder angled, spire whorls sloping; body whorl with 7–8 very large, rounded, evenly-spaced axial folds; folds become largest at shoulder producing large, rounded knobs at shoulder periphery; suture prominent undulating as it overlaps shoulder knobs of spire whorls; body whorl ornamented with 12 large, raised spiral cords; spire whorls ornamented with 5 spiral cords; siphonal canal well-developed, broad, ornamented with 3 large spiral cords; pseudombilicus present, partially covered by parietal shield of siphonal canal; aperture wide, oval in shape.

**Material examined:** HOLOTYPE—Length 27 mm, width 17 mm, in back-reef lagoonal facies (*Stylophora* bioherm) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75984; PARATYPE—length 25 mm, same locality as holotype, in the research collection of the author.

**Discussion:** *Solenosteira suwanneensis* is the oldest-known member of its genus to be found in Eastern North America. The new species is most similar to *S. inornata* Dall, 1890 from the Aquitanian Miocene Tampa Member of the Arcadia Formation, but differs in having a lower, less protracted spire, in having a much coarser shell sculpture composed of strong spiral cords, and in having more numerous and smaller axial folds and shoulder knobs.

#### Superfamily Volutoidea

##### Family Turbinellidae

##### Subfamily Vasinæ

#### Genus *Vasum* Röding, 1795

*Vasum suwanneensis* new species  
(figures 48, 49)

**Description:** Shell small for genus, with broad, sharply-angled shoulder; spire stepped, proportionally low, with spire whorls slightly sloping; suture indented, bordered

by broad, undulating subsutural collars; shoulder ornamented with 10 large, evenly-spaced, open spines; body whorl sculptured with 8 large primary spiral cords; smaller secondary spiral cords present between some primary cords; spire whorls sculptured with 3 large spiral cords; siphonal canal well developed, ornamented with single row of very large, open spines that correspond to the spacing of the shoulder spines; siphonal canal sculptured with 5 large spiral cords, 2 posterior of row of spines and 3 anterior of spines; aperture open, flaring; columella with 3 very large, prominent plications; on holotype, a fourth very faint plication is present between anterior and medial plications.

**Material examined:** HOLOTYPE—Length 39 mm, width (fragmentary, missing last third of body whorl) 23 mm, in back-reef lagoonal facies (*Stylophora* bioherm) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida UF75984.

**Etymology:** Named for the Suwannee Formation of Florida.

**Discussion:** *Vasum suwanneensis* is the first known vase shell to be collected in the Eastern American Oligocene. The new species is most similar to *V. humerosum* Vaughan, 1896 from the Jackson Eocene Moodys Branch Formation, but differs in having a lower, flatter spire, in having more numerous primary spiral cords on the body whorl, in having three very large and prominent spiral cords on the spire whorls, and in having a larger, much more prominent, and more elevated subsutural collar. The new species is also similar to *V. subcapitellum* Heilprin, 1886 from the Aquitanian Miocene Tampa Member of the Arcadia Formation, but differs in having a lower, flatter spire, in having finer body whorl sculpture, and in having smaller, stumpier, and less developed shoulder and siphonal spines. As far as is presently known, *V. suwanneensis* was restricted, ecologically, to the coral bioherms of the Floridian Peninsula.

#### Family Volutidae

##### Subfamily Volutinae

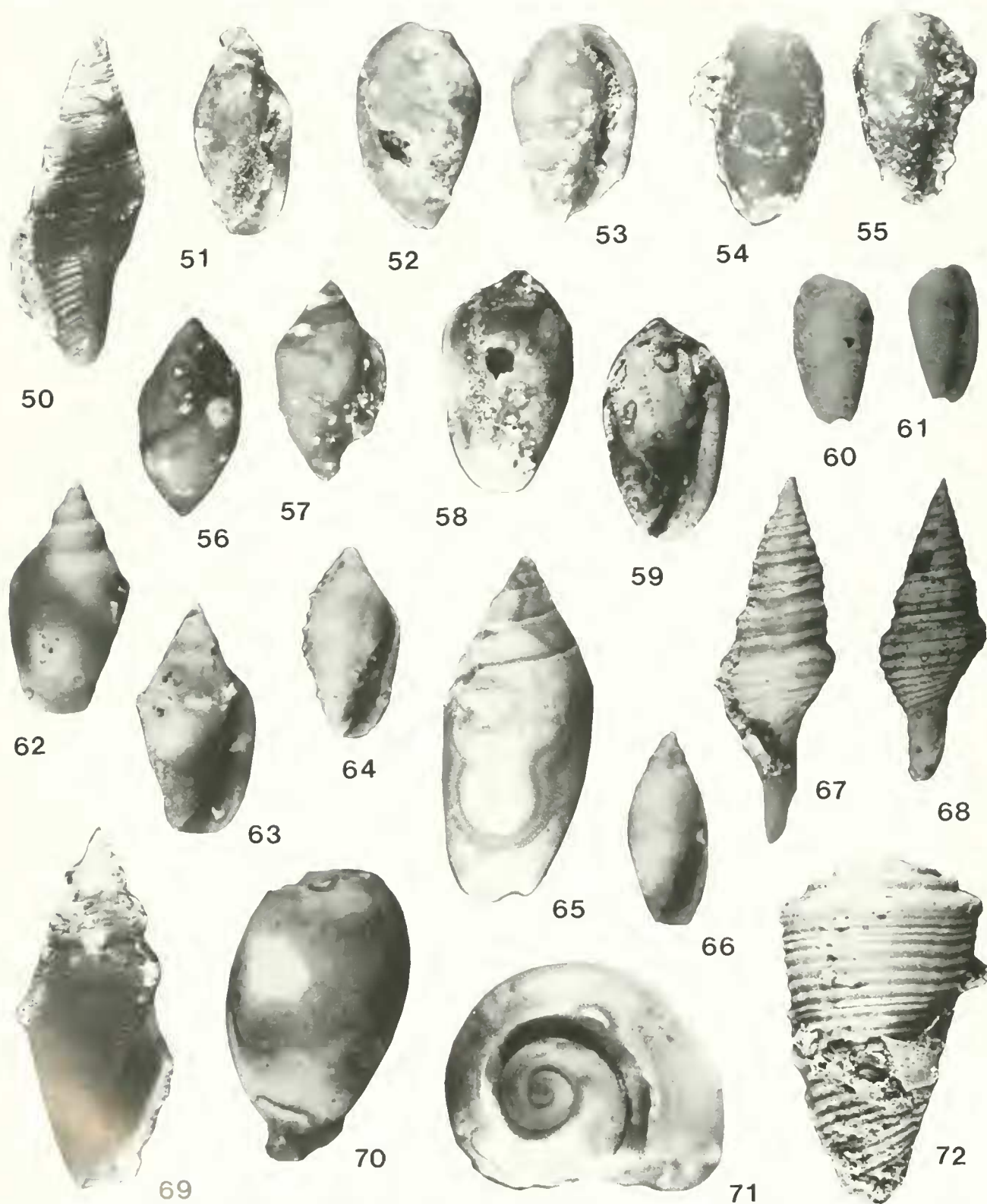
#### Genus *Falsilyria* Pilsbry and Olsson, 1954

*Falsilyria kendrewi* new species  
(figures 37, 38)

**Description:** Shell of average size for genus, fusiform, with high, elevated spire; shoulder, particularly of body whorl and penultimate whorl, sharply-angled, producing distinctly sloping spire whorls; whorls ornamented with 8–10 strong, sharply-angled, evenly-spaced axial ribs; shoulders, particularly of body whorl and penultimate whorls, with 8–10 large, sharp, spinelike knobs, each corresponding to an axial rib; body whorl smooth, with 2–

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(UF 75928) (fragmentary, missing portion of body whorl and siphonal canal), length 24 mm. **48,49.** *Vasum suwanneensis* Petuch, n.sp., holotype (UF 754984), length 39 mm.



Figures 50-72. Mitridae, Marginellidae, Olividae, Comidae, Turritidae, and Cylichnidae from the Suwannee back-reef lagoons. 50, *Fusimitra conquista* Conrad, 1848, length 35 mm. 51, *Hyalina siliciflua* (Dall, 1916), length 12 mm. 52,53, *Persicula dockeryi* Petuch, n.sp., holotype (UF 75988), length 14 mm. 54,55, *Persicula macneili* Petuch, n.sp., holotype (UF 75989), length 11 mm. 56,57, *Prinum jessicae* Petuch, n.sp., holotype (UF 75992), length 16 mm. 58,59, *Prinum sandrae* Petuch, n.sp., holotype (UF 75993), length 15 mm. 60,61, *Persicula suwanneensis* Petuch, n.sp., holotype (UF 75990), length 9 mm. 62,63, *Dentimargo dalli*



3 large spiral cords around anterior end; spire whorls ornamented (particularly on last whorl) with single, large spiral cord; aperture wide, flaring; columella with 5 large, evenly-spaced, beaded plications; protoconch proportionally very small, composed of 2 narrow, smooth whorls.

**Material examined:** HOLOTYPE—Length 37 mm, width 22 mm, in back-reef lagoonal facies (*Stylophora* bioherm) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75985; PARATYPE—length 39 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for Mr. Eric Kendrew of Valrico, Florida, who collected the holotype at the Terramar Pit.

**Discussion:** *Falsilyria kendrewi* occurs together in the Terramar fauna with *F. mansfieldi* (Dall, 1916) (figures 39, 40), but can be readily distinguished from its better-known congener in having a consistently broader, more inflated, and less elongated shell, with prominent spine-like shoulder knobs, and in being a smoother shell that lacks the spiral cord sculpture on the body whorl. Likewise, two *Falsilyria* species occur together in the reefal environments of the Burdigalian Miocene Chipola Formation. Of these two, *F. mansfieldi* appears to be ancestral to the smooth-shouldered *F. amptos* Hoerle and Vokes, 1978 while *F. kendrewi* appears to be ancestral to the knobbed-shouldered *F. pycnopleura* (Gardner, 1937). The smooth-shouldered and heavily-corded *F. musicina* (Heilprin, 1886) from the Aquitanian Miocene Tampa Member of the Arcadia Formation is very similar to *F. mansfieldi* and is the most probable descendant species. No *Falsilyria* with strong shoulder knobs has yet been found in the Tampa fauna. At present, *Falsilyria kendrewi* is known only from the Terramar *Stylophora* bioherms.

#### Family Volutomitridae

Genus *Conomitra* Conrad, 1865

*Conomitra kendrewi* new species  
(figures 44, 45)

**Description:** Shell small for genus, biconic, with sharply-angled shoulder and proportionally low spire; anterior two-thirds of body whorl smooth, unornamented; spire whorls and posterior one-third of body whorl heavily sculptured with large, evenly spaced rib-like plications, averaging 20 per whorl; aperture narrow; columella with 5 large plications, with the largest at posterior end, becoming smaller toward anterior end; anterior-

most tip of siphonal area ornamented with 4–5 impressed spiral threads.

**Material examined:** HOLOTYPE—Length 14 mm, width 8 mm, in back-reef lagoonal facies of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75986; PARATYPES—lengths 14 mm and 17 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for Mr. Eric Kendrew of Valrico, Florida, who collected the holotype at the Terramar Pit.

**Discussion:** This distinctive new Suwannee *Conomitra* species is most similar to the sympatric and widespread Vicksburgian *C. crenulata* Dockery, 1984, but differs in having a much lower spire with a sharply-angled shoulder and cone-shaped appearance. *Conomitra kendrewi* also differs from *C. crenulata* in having shoulder and spire plications that are proportionally larger and fewer in number. In these characters, the new species is also similar to *C. modesta* Dockery, 1984 from the Vicksburg-aged Forest Hill Formation of Mississippi, but differs in having a much lower spire and much more sharply-angled shoulder.

#### Family Marginellidae

##### Subfamily Glabellinae

Genus *Dentimargo* Cossmann, 1899

*Dentimargo dalli* new species  
(figures 62, 63)

**Description:** Shell of average length for genus, slender, with high, elevated spire; suture indented, producing slightly stepped spire whorls; shoulder of body whorl only slightly angled; aperture narrow at posterior end, rapidly expanding and becoming flaring and open at anterior end; columella with 4 large plications; labrum of adult thickened and callused, with smooth inner edge.

**Material examined:** HOLOTYPE—Length 15 mm, width 8 mm, in back-reef lagoonal facies (sea grass bed) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75987; PARATYPES—2 specimens, both 14 mm, in length, same locality as holotype, in the research collection of the author.

**Etymology:** Named in honor of William Healey Dall, the foremost pioneer Floridian paleomalacologist.

**Discussion:** *Dentimargo dalli* is the oldest known member of its genus to be found in the Floridian Cenozoic. The new species is most similar to *D. elegantula*

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Petuch, n.sp., holotype (UF 75987), length 15 mm: **64.** *Prunum cricac* Petuch, n.sp., holotype (UF 75991), length 11 mm: **65.** *Olinia* (*Omogynna*) *brooksvillensis* (Mansfield, 1937), length 19 mm: **66.** *Olivella vicksburgensis* Dockery, 1984, length 10 mm: **67.** *Planorbulina brooksvillensis* (Mansfield, 1937), length 26 mm: **68.** *Planorbulina dowlingi* Petuch, n.sp., holotype (UF 75995), length 26 mm: **69.** *Conorbis porcellanus* (Conrad, 1845), length 36 mm: **70.** *Suwanneoscapha lindae* Petuch, n.sp., holotype (UF 75996), length 17 mm (type of the new genus *Suwanneoscapha*): **71.** *Suwanneoscapha lindae* Petuch, n.sp., view of spire of holotype: **72.** *Comus* (*Asprella*) *kendrewi* Petuch, n.sp., holotype (UF 75994), length 35 mm.

(Dall, 1890) from the Aquitanian Miocene Tampa Member of the Arcadia Formation, but differs in being a larger, more slender and elongated shell with a more sloping shoulder, and in having a much more protracted, distinctly scalariform spire. At present, *Dentimargo dalli* is known only from the Suwannee Formation.

Genus *Persicula* Schumacher, 1817

*Persicula dockeryi* new species  
(figures 52, 53)

**Description:** Shell large for genus, ovoid, inflated, slightly flattened dorso-ventrally; posterior extremities well-developed, greatly projecting, recurved strongly toward right side of shell; aperture narrow, widening slightly toward anterior end; posterior end of aperture recurved sharply toward right side of shell; spire whorls not visible, buried in thick callus; columella with 5 large plications; labrum thickened, smooth along inner edge; sharp-edged callus present along posterior of columella, forming open canal in sharply-recurved posterior end of aperture.

**Material examined:** HOLOTYPE—Length 14 mm, width 9 mm, in back-reef lagoonal facies (open sand bottom) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75988.

**Etymology:** Named in honor of Dr. David T. Dockery III, of the Mississippi State Bureau of Geology, in recognition of his extensive and important contributions to the systematics of the southeastern U.S. Paleogene mollusks.

**Discussion:** Of the known Paleogene and early Neogene *Persicula* species, *P. dockeryi* is most similar to *P. progravida* (Gardner, 1937) from the Burdigalian Miocene Oak Grove Formation of southern Georgia and northwestern Florida. The new Oligocene species differs from this possible Miocene descendant in being a larger, more elongated shell, in having a far more recurved posterior end of the aperture, and in having much better developed, more conspicuous, and more-projecting posterior extremities. At present, *Persicula dockeryi* is known only from the Suwannee Formation.

*Persicula macneili* new species  
(figures 54, 55)

**Description:** Shell of average size for genus, elongately ovate, with relatively straight sides; extremities rounded, only faintly produced, not projecting beyond spire; aperture narrow throughout, slightly recurved to right side of shell at posterior end; columella with 5 plications, labrum thickened with smooth inner edge.

**Material examined:** HOLOTYPE—Length 11 mm, width 7 mm, in back-reef lagoonal facies (sea grass bed?) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75989.

**Etymology:** Named in honor of Dr. F. Stearns Mac-

Neil, late of the U.S. Geological Survey, in recognition of his important contributions to the systematics of the Vicksburg mollusks.

**Discussion:** *Persicula macneili* is similar in appearance to *P. halensis* (Dall, 1916) from the contemporaneous Flint River Formation, but differs in being a larger, more elongated shell with distinctly straighter sides. The new species is also similar to the Vicksburgian *P. vicksburgensis* Dockery, 1984 from the Mint Springs Formation of Mississippi, but differs in being a much larger, more elongated shell with a lower and more rounded spire.

*Persicula suwanneensis* new species  
(figures 60, 61)

**Description:** Shell of average size for genus, extremely elongated and cylindrical, with straight sides; aperture narrow throughout, recurved to right side of shell at extreme posterior end; spire area flattened; posterior extremity on labial side better developed than posterior extremity of columellar side, projecting beyond plane of spire; extreme posteriormost edge of columellar area with thin, sharp-edged blade, producing open posterior canal with labial projection; columella with 5 plications; labrum thickened, with very fine crenulations along inner edge.

**Material examined:** HOLOTYPE—Length 9 mm, width 5 mm, in back-reef lagoonal facies (sea grass beds?) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75990; PARATYPE—length 10 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for the Suwannee Formation of Florida.

**Discussion:** *Persicula suwanneensis* is the most slender and elongated of all known Oligocene and Miocene *Persicula* species. This new Suwannee marginella is similar only to the sympatric *P. macneili*, but differs in being even narrower and more elongated, in having the posterior end of the aperture being more recurved, and in having the distinctly projecting posterior labial extremity.

Genus *Prunum* Herrmannsen, 1852

*Prunum cricae* new species  
(figure 64)

**Description:** Shell small for genus, elongately ovate, with high pyramidal spire; shoulder slightly angled; aperture narrow at posterior end, expanding rapidly toward anterior end, becoming wide, flaring, and open; columella distinctly arcuate, with 4 large plications; labrum thickened, smooth along inner edge.

**Material examined:** HOLOTYPE—Length 11 mm, width 6 mm, in back-reef lagoonal facies (open sand bottom) of the Suwannee Formation, Terramar Pit, west-

ernmost Polk County, Florida, UF75991; PARATYPES—Lengths 8 mm and 9 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for Ms. Erica Kendrew, daughter of Mr. Eric Kendrew, of Valrico, Florida.

**Discussion:** Of the three *Prunum* species now known from the Suwannee Formation, *P. ericae* is the smallest and most slender in outline. In general size and shape, *P. ericae* is most similar to *P. infecta* (Dall, 1915) from the Aquitanian Miocene Tampa Member of the Arcadia Formation, but differs in being a more slender shell with a wider aperture. The new species may be ancestral to the radiation of small, high-spined *Prunum* species found in the Tampa Member and including such distinctive taxa as *P. infecta*, *P. impagina* (Dall, 1915), *P. posti* (Dall, 1915), and *P. inepta* (Dall, 1890). The small un-named, high-spined *Prunum* illustrated by MacNeil and Dockery (1984, plate 35, figures 4,5, as “*Marginella* sp.?”) from the Byram Formation of the Vicksburg Group is similar to *P. ericae* and may be conspecific.

*Prunum jessicae* new species  
(figures 56, 57)

**Description:** Shell of average size for genus, cylindrical in form, with distinctly angled shoulder; spire high, protracted, slightly scalariform; spire whorls and shoulder of body whorl sloping; aperture narrow, widening only slightly toward anterior end; columella straight, with 4 large plications; labrum (missing on holotype, but present on paratype) slightly thickened, smooth along inner edge.

**Material examined:** HOLOTYPE—Length 16 mm, width 9 mm, in back-reef lagoonal facies (open sand bottom) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75992; PARATYPES—lengths 14 mm and 11 mm (fragmentary), same locality as holotype, in the research collection of the author.

**Etymology:** Named for Ms. Jessica Kendrew, daughter of Mr. Eric Kendrew, of Valrico, Florida.

**Discussion:** With its large size and high scalariform spire, *P. jessicae* is the most easily-recognizable of the Suwannee *Prunum* species. The new species is most similar to, and is possibly the ancestor of, the Aquitanian *P. silicata* (Mansfield, 1937) from the Tampa member of the Arcadia Formation. *Prunum jessicae* differs from the early Miocene species in having a more inflated shell with a more-angled shoulder, and a higher, more protracted spire.

*Prunum sandrae* new species  
(figures 58, 59)

**Description:** Shell of average size for genus, inflated, ovately subcylindrical; shoulder sharply-angled; spire

proportionally low; spire whorls slightly sloping; aperture narrow, widening slightly toward anterior end; columella straight, with 4 large plications; labrum thickened, smooth along inner edge.

**Material examined:** HOLOTYPE—Length 15 mm, width 11 mm, in back-reef lagoonal facies (open sand bottom) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75993; PARATYPES—three specimens, lengths 13 mm, 15 mm, and 19 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for Mrs. Sandra Kendrew, wife of Mr. Eric Kendrew, of Valrico, Florida.

**Discussion:** *Prunum sandrae* is very similar to, and is undoubtedly the ancestor of, the Aquitanian Miocene *P. gregaria* (Dall, 1915) from the Tampa Member of the Arcadia Formation. Both shells have the same large size, low spire, and narrow aperture. The new species differs from its descendant, however, in being consistently a wider and more inflated shell. *Prunum sandrae* appears to be the commonest marginellid in the Suwannee Formation at Terramar.

Superfamily Conoidea

Family Conidae

Genus *Conus* Linnaeus, 1758

Subgenus *Asprella* Schanfuß, 1869

*Conus (Asprella) kendrewi* new species  
(figure 72)

**Description:** Shell of average size for subgenus, elongated, tapering, with straight sides; spire flattened, with faintly stepped, slightly projecting whorls; shoulder sharply-angled, bounded by thick, ridgelike carina; carina present on spire whorls, producing depressed scalariform appearance; body whorl heavily sculptured with (on unique holotype) 24 large, evenly-spaced, highly-raised spiral cords; spire whorls ornamented with 5 fine, evenly-spaced spiral threads; aperture straight, narrow.

**Material examined:** HOLOTYPE—Length 35 mm, width 21 mm, in back-reef lagoonal facies (*Stylophora* bioherm) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF 75994.

**Etymology:** Named for Mr. Eric Kendrew of Valrico, Florida, who collected the holotype at the Terramar Pit.

**Discussion:** *Conus kendrewi*, with its extremely heavy corded body sculpture, wide shoulder carina, and depressed scalariform spire, is the most distinctive cone shell known from the Eastern American Oligocene. The only contemporaneous cone that even remotely resembles this new species is the sympatric Suwannee and Flint River *C. (Lepticonus?) cookei* Dall, 1916. *Conus kendrewi* differs from this more wide-ranging species in having a much coarser and stronger spiral cord sculpture, in having a distinctly stepped spire, and in having



a prominent shoulder carina that extends beyond the body whorl outline.

Family Turridae

Subfamily Turriculinae

Genus *Pleurofusua* de Gregorio, 1890

*Pleurofusua dowlingi* new species  
(figure 68)

**Description:** Shell of average size for genus, elongately fusiform, with high, protracted, scalariform spire, rounded body, and thick, elongated siphonal canal; shoulder slightly angled; suture indented; body whorl ornamented with 9 large, thick spiral cords that become thinner toward anterior; siphonal canal ornamented with 10–12 fine, thin spiral cords; suture bounded with single, large spiral cord; sutural cord separated from shoulder spiral cord by wide, depressed gap, producing slightly canaliculate appearance; spire whorls ornamented with 3 large spiral cords; aperture proportionally small, oval in shape.

**Material examined:** HOLOTYPE—Length 26 mm width, in back-reef facies of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75995; PARATYPES—lengths 19 mm and 23 mm, same locality as holotype, in the research collection of the author.

**Etymology:** Named for Mr. William Dowling of Lake Worth, Florida, who assisted me at the Terramar Pit and who collected the holotype.

**Discussion:** *Pleurofusua dowlingi* occurs together with the congeneric *P. brooksvilleensis* (Mansfield, 1937) (figure 67) at the Terramar Pit, but is never as common. The new species differs from the better-known *P. brooksvilleensis* in being a consistently more heavily-sculptured shell with coarser and thicker spiral cords, in lacking varical undulations on the spire and body whorl, and in having a much narrower gap between the sutural cord and shoulder cord.

Order Cephalaspidea

Superfamily Cylichnoidae

Family Cylichnidae

Genus *Suwanescapha* new genus

**Diagnosis:** Cylichnid bubble shells of greater-than-average size; widely inflated, ovate, very thin and fragile; spire flattened, planar in profile; suture extremely depressed, producing very deep, wide, open channel (see figure 71); edge of shoulder along channel developed into very thin, sharp, erect blade; body whorl smooth, faintly sculptured with extremely numerous, very fine spiral threads; aperture very wide and flaring, oval in shape; apical perforation absent, replaced by raised protoconch; anal notch well-developed, corresponding to raised shoulder blade along spire channel.

**Type species:** *Suwanescapha lindae* Petuch, new

species, Suwannee Formation, early Oligocene of Florida (figures 70, 71). At present, known only from the Terramar Pit, Polk County, Florida.

**Etymology:** A combination of "Suwannee" and "scapha" (barrel).

**Discussion:** This unusual cylichnid most closely resembles members of the genus *Scaphander* Montfort, 1810, particularly in shape and size, but is immediately separable by possessing the characteristic widely canaliculate spire. In having a flat, channeled spire, *Suwanescapha* somewhat resembles a giant version of the diminutive cylichnid genus *Acteocina* Gray, 1847, but differs in being a much more inflated, rotund shell and in having a deeper and much wider spire channel. Morphologically, *Suwanescapha* combines the large size and inflated shell form of *Scaphander* and the flat, channeled spire of *Acteocina*.

*Suwanescapha lindae* new species  
(figures 70, 71)

**Description:** As for diagnosis of genus.

**Material examined:** HOLOTYPE—Length 17 mm, width 11 mm, in back-reef lagoonal facies (sea grass beds?) of the Suwannee Formation, Terramar Pit, westernmost Polk County, Florida, UF75996; PARATYPES—lengths 19 mm, and 21 mm, same locality as the holotype, in the research collection of the author.

**Etymology:** Named for my wife, Linda Joyce Petuch, who stoically watched over our family while I was off exploring the Suwannee Formation.

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## APPENDIX 1

Gastropods From The Back-Reef Lagoonal Facies Of The Suwannee Formation In The Terramar Pit, Polk County, Florida. V = Widespread Vicksburgian Species; F = Species Also Known From The Flint River Formation; S = Species Known Only From The Suwannee Formation.

### Trochidae

*Calliostoma silicatum* Mansfield, 1937 S

### Turbinidae

*Astraca* (*Astralinum*) *polkensis* Petuch, n.sp. S

### Potamididae

*Pyrazisimus kendrewi* Petuch, n.sp. S

*Telescopium blackwaterensis* (Mansfield, 1937) S

*Telescopium hernandoensis* (Mansfield, 1937) S

### Cerithiidae

*Bittium caseyi* MacNeil, 1984 V

*Cerithioclava cutextile* (Dall, 1916) F

*Cerithium* (*Thericium*) *insulatum* Dall, 1916 F

*Cerithium* (new genus?) *cookei* Dall, 1916 F

*Cestumcerithium brooksrellensis* (Mansfield, 1937) S

*Cestumcerithium liveoakensis* (Mansfield, 1937) S

*Cestumcerithium pascoensis* (Mansfield, 1937) S

*Cestumcerithium vaginatum* (Dall, 1916) F

*Prismacerithium prisma* Petuch, n.sp. S

*Semivertagus menthafontis* MacNeil 1984 V

*Semivertagus silicium* (Dall, 1916) F

### Modiolidae

*Modulus liveoakensis* Mansfield, 1937 S

### Turritellidae

*Apicula bowenae* (Mansfield, 1937) S

*Toreula caseyi* (MacNeil, 1984) S

*Toreula mississippiensis* (Conrad, 1848) V

### Crepidulidae

*Calypttraca conradi* MacNeil, 1984 V

### Strombidae

*Orthaulax hernandoensis* Mansfield, 1937 F

### Ficidae

*Ficus mississippiensis* Conrad, 1848 V

### Cassidae

*Phalium caelatura* (Conrad, 1848) V

### Personiidae

*Distorsio* (*Rhyssma*) *crassidens* Conrad, 1848 V

### Naticidae

*Ampullinopsis flintensis* (Mansfield, 1937) F

*Natica caseyi* MacNeil, 1984 V

*Pachycrommium dalli* Petuch, n.sp. F, S

*Pachycrommium mansfieldi* Petuch, n.sp. S

*Sium mississippiensis* (Conrad, 1848) V

### Cypraeidae

*Cypracorbis kendrewi* Petuch, n.sp. (V?) S

### Muricidae

*Chicoreus stetopus* (de Gregorio, 1890) V

*Poirieria* (*Dallinaurex*) *rufirupicolus* (Dall, 1916) F

*Pterynotus propepost* (Mansfield, 1937) S

*Talitipplus mississippiensis* (Gertmann, 1969) V

### Busyconidae

*Spinifulgur gemmulatum* Petuch, n.sp. S

### Buccinidae

*Pallacera caseyi* (MacNeil, 1984) V

*Pallacera vicksburgensis* (Conrad, 1848) V

*Solenosteira suwanneensis* Petuch, n.sp. S

### Melongenidae

*Myristica crassicornuta* (Conrad, 1848) V

### Turbinellidae

*Clavolites vicksburgensis* (Conrad, 1848) V

*Turbinella suwanneensis* (Mansfield, 1937) S

*Vasum suwanneensis* Petuch, n.sp. S

### Volutidae

*Falsilyria kendrewi* Petuch, n.sp. S

*Falsilyria mansfieldi* (Dall, 1916) F

### Volutomitridae

*Conomitra crenulata* Dockery, 1984 V

*Conomitra kendrewi* Petuch, n.sp. S

*Conomitra staminea* (Conrad, 1848) V

### Mitridae (Pleioptygmaticidae?)

*Fusimitra conquista* (Conrad, 1848) V

### Olividae

*Olin* (*Omogynna*) *brooksrellensis* (Mansfield, 1937) S

*Olivella liveoakensis* Mansfield, 1937 S

*Olivella vicksburgensis* Dockery 1984 V

### Marginellidae

*Dentimargo dalli* Petuch, n.sp. S

*Nyalina siliciflvia* (Dall, 1916) F

*Persicula dockeryi* Petuch, n.sp. S

*Persicula macneili* Petuch, n.sp. S

*Persicula suwanneensis* Petuch, n.sp. S

*Prunum ericae* Petuch, n.sp. S

*Prunum jessicae* Petuch, n.sp. S

*Prunum sandrae* Petuch, n.sp. (V) S

### Conidae

*Conus* (*Leptocomus*) *cookei* Dall, 1916 F

- Conus (Asprella) kendrewi* Petuch, n.sp. S  
 Terebridae  
*Terebra (Terebellina) divisura* Conrad, 1848 V  
 Turridae  
*Conorbis porcellanus* (Conrad, 1848) V  
*Crassispirella lyopleura* (MacNeil, 1954) V  
*Euclathurella liveoakensis* Mansfield, 1937 S  
*Pleurofusua brooksvillensis* (Mansfield, 1937) S  
*Pleurofusua dowlingi* Petuch, n.sp. S  
*Pleurofusua plutonica* (Casey, 1903) V  
*Pleurofusua serrata* (Conrad, 1848) V  
*Polystira subsimilis* (Casey, 1937) V  
 Cylichnidae  
*Suwanescapha lindae* Petuch, n.sp. S

## APPENDIX 2

Additional Suwannee Formation Gastropods That Were Reported By Mansfield (1937) and E. Vokes (1992) But Were Not Collected (In This Study) At The Terramar Pit. V = Widespread Vicksburgian Species; F = Species Also Known From The Flint River Formation; S = Species Known Only From The Suwannee Formation.

- Fissurellidae  
*"Diodora chipolana (Dall)"* (probably = *D. mississippiensis* (Conrad, 1848)) V  
 Cerithiidae  
*Cerithium georgianum* Lyell and Sowerby, 1845 F  
*"Cerithium suwanneensis"* Mansfield, 1937  
 Turritellidae  
*"Turritella cf. halensis Dall"* (= *Apicula cf. halensis*) F  
 Xenophoridae  
*"Xenophora couchyliophora Born"* (= *X. humilis* (Conrad, 1848))  
 Terebellidae  
*Terebellum hernandoensis* Mansfield, 1937 S  
 Cassidae  
*"Cassis sp."* (= *C. flintensis* Mansfield, 1940) F  
 Muricidae  
*Takia portelli* (E. Vokes, 1992) S  
 Buccinidae (?)  
*"Latirus sp."* (appears to be a *Cantharus* sp.) S  
 Volutidae  
*Lyria mississippiensis* Conrad, 1848 V